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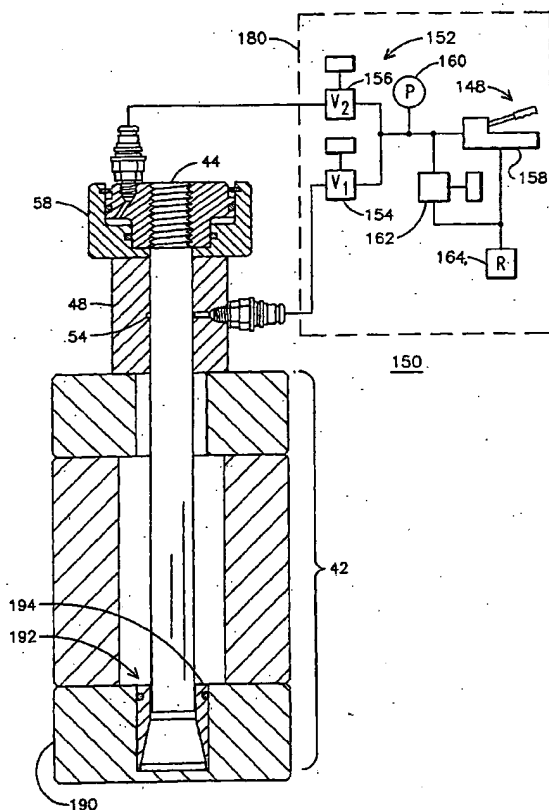
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(54) Title: BOLTED ASSEMBLY AND APPARATUS AND METHOD FOR TENSIONING THE BOLTED ASSEMBLY



(57) Abstract: A system (150) and method of tensioning a bolt (44) across a flange assembly (42). A tensioning apparatus (40) includes the bolt and an unthreaded nut (48) connected to the shank member by an interference fit. The interference fit may be selectively relaxed by applying a fluid pressure to a groove (54) between the nut and the bolt. A tensioner (58) is energized by a pressure to pre-load the bolt by pulling on the bolt while pushing on the nut while the interference fit is sufficiently relaxed to allow relative movement between the nut and the bolt. The tensioner is sized to achieve the required pre-load in the bolt at the same working fluid pressure that is necessary to relax the interference fit on the stretched bolt, thus permitting a single pressure source (148) to be used for both functions. Once the pre-load is established, the interference fit is reestablished by releasing pressure to the nut to secure the nut in position for maintaining the closure force across the flange assembly after the tensioner is removed. Because the nut does not need to rotate, the pre-load may be applied directly through the nut without the use of a bridge, thereby eliminating the need for over-stressing of the bolt to accommodate seating of the nut once the tensioner is relaxed.



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